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# U. S. DEPARTMENT OF AGRICULTURE

FARMERS' BULLETIN No. 1702

## PREPARING PEACHES FOR MARKET



**P**EACHES ARE GROWN commercially throughout the United States under a wide range of conditions. There are important producing areas in the Southern, North Atlantic, North Central, and far Western States, and a large part of the commercial crop must be shipped long distances to market.

The peach is a highly perishable fruit. To avoid severe losses caused by poor condition when placed on the market, proper methods and care are necessary in harvesting, handling, grading, packing, and shipping.

Losses to growers and shippers often result from picking the peaches too green or allowing them to remain on the tree too long. Damage to the fruit—with consequent loss—is often caused by bruising, caused by the use of improper methods of handling and loading. Good construction of the packing house and the use of good sizing and packing equipment facilitate the preparation of peaches for market.

Standard grades are widely used in packing peaches and their use has many advantages.

This bulletin describes the methods that have been successfully used in preparing the peach crop for market, and gives information and suggestions to growers on improving their own methods.

This bulletin is a revision of and supersedes Farmers' Bulletin 1266, Preparation of Peaches for Market.

# PREPARING PEACHES FOR MARKET<sup>1</sup>

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## HARVESTING

**T**HE CONDITION of peaches upon their arrival in the markets depends largely on the care and method of handling them and on the stage of maturity at which they are picked and shipped. The peach ripens so quickly that it may change, in three or four days, from a condition of immaturity to one of overripeness. It is to the growers' advantage to make every effort to pick the peaches at just the right time and to prevent injury to the fruit by careful handling and by using proper methods, utensils, and equipment.

## TIME OF PICKING

Picking at the right time is more important in harvesting peaches than in harvesting most other fruits, in order to avoid the serious losses that are now annually sustained by many growers through shipping immature or overripe fruit.

Peaches should reach the market nearly ripe enough for eating but firm enough to be handled through the ordinary channels of trade. The best degree of ripeness at picking time to insure this condition depends largely on the method of shipment to market, the weather conditions, the variety, and the speed and method of handling.

Peaches intended for shipment by motor truck to near-by markets are often allowed to practically ripen on the trees, with satisfactory results. In such instances the fruit is usually trucked to market

<sup>1</sup> This bulletin is based on Farmers' Bulletin 1266, Preparation of Peaches for Market, by H. W. Samson, formerly specialist in standardization, Bureau of Agricultural Economics. Acknowledgment is made of the assistance rendered by field representatives of the Division of Fruits and Vegetables who supplied specific information relating to various producing areas.



during the night for early morning sale. Unless it moves rapidly through the trade channels to the consumer or is peddled direct to the consumer there is likely to be heavy loss through overripeness.

Peaches that are to be shipped a considerable distance in refrigerator cars should be picked before they are ripe enough for eating. In some important producing areas, as in the Middle Atlantic and South Atlantic States and North Central States, a general rule is to pick the fruit about 36 to 48 hours before it would reach the proper maturity for eating if left on the trees. This rule is based on average weather conditions. Fruit that has been maturing slowly during a period of cool weather will ripen at a much more rapid rate if the weather turns hot, whereas cool weather will retard the ripening.

One widely used indication that the fruit is about ready to pick is the change in the ground color, from the green that is indicative of immaturity to a light yellow or lemon yellow in the case of yellow-fleshed varieties or to a creamy white in the case of white-fleshed varieties. There is a swelling of the flattened sides of a peach just prior to maturity and some growers defer picking until this occurs.

The stage of maturity at which the peaches should be picked differs to some extent with the variety, as some varieties deteriorate very quickly after reaching maturity and others more slowly. Some ripen unevenly and others have a tendency to drop as they approach maturity. For example, the Hiley, an important commercial variety in the South, ripens more slowly than most other early or medium-early varieties and may be left on the tree longer after it begins to show some indications of maturity. The Elberta, the most popular and widely grown commercial variety and one of the best varieties for long-distance shipment, must be picked promptly after reaching a certain stage of maturity, to avoid loss from dropping.

Fruit that is to be handled carefully and rapidly and is to be precooled before shipping or placed in the refrigerator car within a short time after picking can be allowed to reach a more advanced stage of maturity than if it were to stand for a considerable time in the orchard or packing shed on a warm day before being placed under refrigeration.

In an effort to obtain the high prices frequently paid for the earliest shipments from the South, peaches are sometimes sent to market when they are so green that they shrivel instead of ripening; instead of high prices the shipper receives low prices and may suffer a loss. Unfortunately these losses are only one part of the injury done to the industry through this practice, as the consuming public soon loses confidence in the quality of the fruit, and this loss of confidence is reflected in the price of all peaches on the market for some time.

In picking, the trees must be gone over a number of times if the fruit is to be harvested at the proper stage. In some areas, under average conditions, three pickings are usually made. Under other conditions more pickings are necessary and occasionally fewer than three will suffice. Although the ideal stage of maturity for picking should be kept in mind, there are usually many practical difficulties which make it impossible to pick all of the fruit at just the right time, especially if crops are very large. Under such conditions

the best practice is to include in each picking the fruit that would be improved somewhat in shipping quality by remaining on the tree for a short time. If any variation is necessary from the rule, it is better to pick slightly too green than too ripe, for although immaturity impairs the quality, overripeness may and frequently does result in a total loss of the shipment.

#### CARE IN PICKING

Great care must be used in picking such a tender fruit as the peach, to prevent bruising and consequent deterioration and loss. Damage to fruit frequently results from careless handling by pickers in tossing the peaches into baskets on the ground or pouring them from the picking utensils into the orchard boxes or baskets used for hauling the fruit to the packing house. This sometimes occurs even in orchards where the fruit is handled with scrupulous care after arriving at the packing house. Consequently the need for closer attention to the picking operation can not be too strongly emphasized. Badly bruised fruit is practically worthless for shipping. Furthermore, not only is the cost of sorting increased by its presence, but since the bruises are not always readily detected at this time, much injured fruit that is susceptible to the entrance of decay organisms and that endangers the sound fruit may be packed.

To provide a check on the work each picker should be required to place a ticket bearing his number in each field box or basket of peaches which he has picked, and a penalty should be imposed for failing to do the work well. The grower or a competent foreman should inspect the picked fruit frequently, in the orchard, to see that the work is properly done.

#### PICKING UTENSILS

Various types of picking utensils are in use. In the South Atlantic States the  $\frac{5}{8}$ -bushel round stave basket is commonly used. (Fig. 1.) Drop-bottom bags and buckets are used by some growers in various areas, including the Middle West and Rocky Mountain States. Hampers and bushel baskets are also used to some extent.

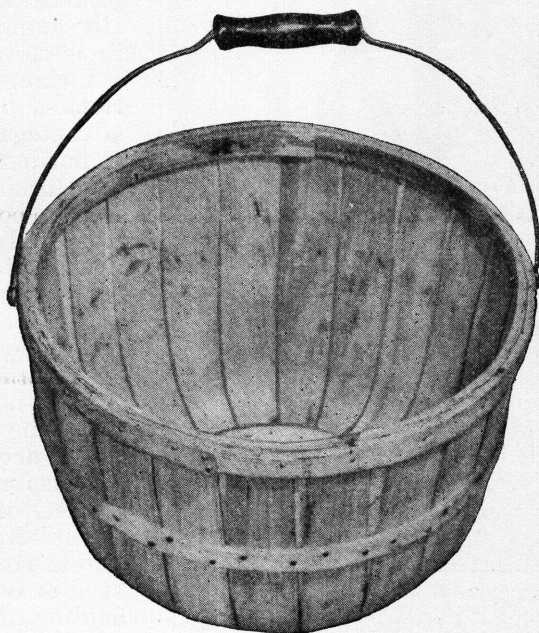


FIGURE 1.—The  $\frac{5}{8}$ -bushel round stave basket is a popular picking container in the South



If the  $\frac{5}{8}$ -bushel basket is used in picking, it is also used in hauling the fruit to the packing house. This avoids the danger of bruising the fruit when it is poured from one container to another; this object is particularly important in handling the more tender varieties. The  $\frac{5}{8}$ -bushel baskets are usually made of oak or elm staves and are durable and satisfactory for hauling the fruit. An objection to their use is that when used in picking they do not permit the free use of both hands.

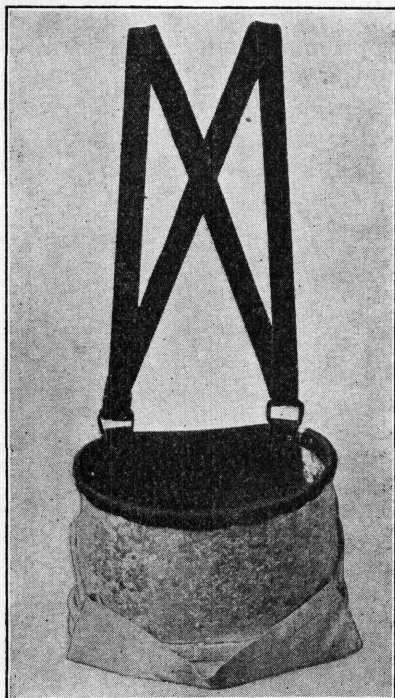


FIGURE 2.—This type of drop-bottom picking bucket has a padded rim to prevent bruising the fruit. As the bottom of the bucket is slightly larger than the top, emptying is facilitated.

In some districts ordinary galvanized metal buckets are used in picking and the peaches are usually hauled to the packing shed in these buckets.

Picking baskets lined with corrugated paper have been used to advantage in certain sections, as in northern Ohio. They prevent some bruising.

Drop-bottom picking sacks are employed to a considerable extent in the Middle West and in many of the large orchards of Texas and Arkansas, but with few exceptions they are used only in harvesting the Elberta variety.

Drop-bottom buckets (fig. 2), operating on the same principle as the drop-bottom picking sacks, are also used, but both sacks and buckets of this type are open to the objection that the fruit must be transferred to other containers, such as field boxes or baskets, for hauling to the packing houses, and care is necessary in this operation to prevent bruising. (Fig. 3.)

In the Pacific Northwest galvanized-metal buckets both with metal bottoms and canvas drop bottoms are used. The all-canvas picking bag is also in use in this region.

The 16-quart and 20-quart hampers are popular picking containers in the Middle and North Atlantic States and in other sections where they are employed as shipping packages, but frequently they are very frail and begin to break after being used for a few days in the orchard. To avoid this loss some growers send them to the orchard only once for picking, and then use them as shipping packages. Because of its small base, the hamper often upsets when filled, but this can be avoided if the pickers use a little care in placing it.

In some instances hampers and baskets have been used to much better advantage by carrying them under one arm, supported by a strap passing over the shoulder. The strap is caught into each side of the

basket by heavy wire hooks. The picker can use both hands and the speed of the work is increased to a marked degree. The temptation to put the basket on the ground and toss the fruit into it is also avoided. The straps should be wide enough not to chafe the picker's shoulder and the hooks should be large enough to be easily attached and released.

#### HAULING FROM THE ORCHARD

Various types of trucks and wagons are used in hauling peaches from the orchard to the packing house. In general, wagons used for this purpose should be equipped with springs to reduce the amount of bruising, although where the soil is sandy, wagons without springs have been used successfully. The most convenient type has a low bed to facilitate loading and unloading and movement under the trees



FIGURE 3.—In this orchard in the Middle West drop-bottom picking utensils are used and the peaches are then transferred to baskets for hauling to the packing house

in the orchard, but on account of the relatively heavy draft many growers prefer wagons of the usual height, equipped to accommodate either one or two layers of baskets. Where two tiers of baskets are hauled the wagon or truck is provided with crosspieces about 20 inches above the bed, and loose boards are laid on these crosspieces to support the second tier of baskets. A deck may be made, divided in the middle and equipped with hinges, so that it can be raised while the lower tier is being loaded and unloaded. It should be built in lattice form, of light strips, and supported, when down, by small posts. Where the ground is fairly level, wagons equipped with platforms, known as "flats" (fig. 4), are used for hauling large loads so that two tiers of baskets will not be necessary, and smaller flats are sometimes used for hauling between the tree rows. In the Rocky Mountain States sleds are sometimes used in hauling from the orchard.



In large orchards, in which the distance to the packing house is considerable and the rows of trees are close together, it is often necessary to use small 1-horse wagons for hauling the peaches out to the main roadways, where they are transferred to trucks. These small wagons preferably should be of the cut-under type. Re-handling is objectionable, but under certain conditions it may be better than driving a 2-horse wagon between the trees. In some large orchards, as in Delaware, wagon trains pulled by tractors have been used in hauling peaches from the orchards.

The operation of hauling peaches to the packing house should be carefully organized. Enough vehicles should be employed to haul the fruit out of the orchard soon after it is picked without the



FIGURE 4.—A wagon equipped with a wide platform known as a "flat" is convenient for hauling peaches to the packing house

necessity of handling it so rapidly as to cause bruising. Unless the hauling is well organized and efficiently done the fruit may remain in the orchard unnecessarily long or may be damaged by rough handling. Regular deliveries at the packing house are desirable so that the grading and packing force will not be alternately idle and rushed. It is a serious matter to the grower to have the whole packing crew idle and waiting for peaches to be hauled from the orchard. In a large orchard a capable foreman should be in charge of the hauling.

#### PACKING HOUSES

Peach-packing houses differ in type and construction in different producing areas and within the same area. In most of the important shipping sections there are well-constructed packing houses, and



also cheaply built packing sheds, often without floors. In some sections, particularly where weather conditions at harvest time are generally favorable, some packing is done in the open.

Packing can be done more efficiently in a conveniently located, well-arranged, and fully equipped packing house. (Fig. 5.) The expense that a grower is justified in assuming in building and equipping a packing house depends on individual conditions, such as size and productivity of orchard and method of marketing. Growers who have a small volume of production, or who have nearby market outlets, or who sell the fruit orchard-run to merchant truckmen may not be justified in large outlays.

Central packing houses where growers bring their fruit to be packed are in use in some districts. In the State of Washington

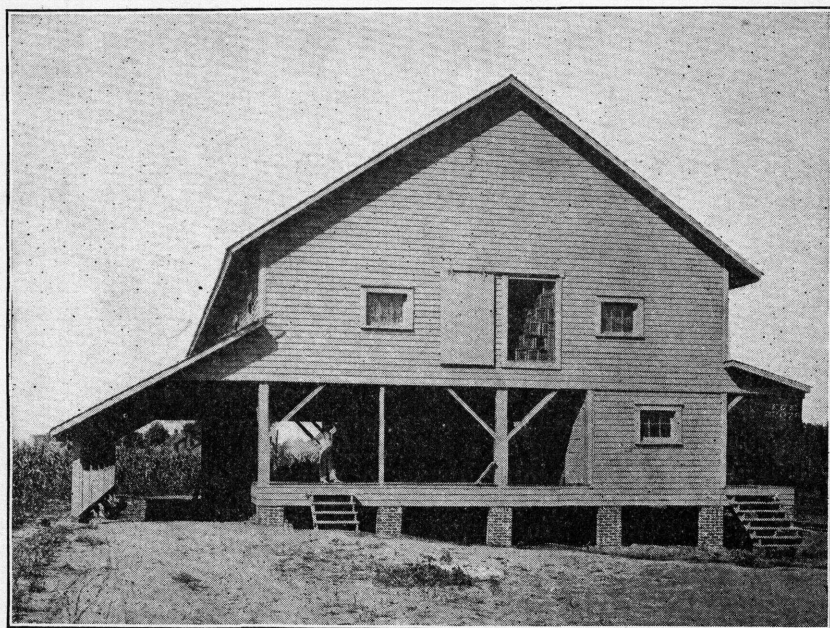


FIGURE 5.—A typical Georgia peach-packing house

it has been the general practice to pack peaches on the ranches, but recently there has been a tendency toward the use of central packing houses.

#### LOCATION

If the crop is to be shipped by rail and the orchard is located on a railroad or a spur track, the packing house should be built alongside the track in order to do away with the necessity of hauling the packed fruit. Many packing houses are located along railroad tracks several miles from the orchards and near villages. The fruit is hauled from the orchard in trucks. The advantages claimed for this system are that the packed fruit can be loaded directly on the cars and that packing-house employees need not be transported to the orchards. In such an arrangement it is necessary to take care that

the peaches are not damaged by bruising in hauling them from the orchard to the packing house.

If the peaches are packed in an orchard with no railroad siding, the principal consideration is to reduce to a minimum the distance the loose fruit must be hauled, as peaches are more likely to be bruised when hauled loose than after being packed. In a flat country, like the Fort Valley section in Georgia, the most desirable location is near the center of the orchard, or at a central point if the output of several orchards is packed through one house.

#### CONSTRUCTION

A common type of packing house in the South and in some other areas is a frame building, two stories high. The upper story or loft, where crate materials and baskets are stored, is inclosed, and the lower floor, where the packing is done, is open. These houses are usually 35 to 60 feet wide and from 60 to 150 feet long. The fruit moves across the short dimension of the house during the packing process, so that operations in a house less than 35 feet wide are likely to be hindered by insufficient space for loose and packed fruit. Baskets or crate materials from the loft are usually supplied to the packers on the lower floor by means of chutes, which run either parallel to or at right angles to the packing benches.

The first floor should be built at approximately the same height as a truck or wagon bed, or the floors of the refrigerator cars if the house is on a railroad siding. This height facilitates handling the fruit and permits good ventilation. The packing-room ceiling should be about 10 feet high. Most packing houses have covered driveways, which serve the excellent purpose of protecting the fruit while the wagons are being unloaded and loaded, but which have the disadvantage of cutting off a part of the light.

The various types of packing houses include some that are inclosed on three or four sides, in which case windows should be used. Some are 1-story structures. Galvanized-iron or tin roofs without insulating material underneath often permit extremely high temperatures in the packing houses in the hot weather.

The size and output of packing houses vary widely within most areas. In Illinois a common size has two sizing machines and a capacity of 2 to 8 or 10 cars a day. In Arkansas there is a wide variation in size and type; some of the larger houses have a capacity of about 20 cars a day.

In some sections growers who produce other fruits, like apples and pears, use the same house and some of the same equipment for all packing operations. A type of packing house used to some extent in northern Ohio is about 175 feet long and 36 feet wide, with a 10-foot covered driveway. The sizing machines are placed in pits 14 feet square and 3 feet deep. The baskets are packed in these pits and the packed fruit is set out on the main floor by the packers.

#### LIGHTING

Proper light for grading operations is highly important. Even in houses with open sides the lighting facilities are sometimes inadequate especially when packed containers are stacked high on one side



of the house. This difficulty might be overcome by putting in hip-roofed skylights and light shafts over the sorters, where the additional illumination is most necessary. If the construction of the house can not be changed without excessive cost, the interior should be painted white. Some houses are equipped with electric lights over each bin. Such lights are essential when night work is necessary during the height of the shipping season and may be desirable on cloudy days.

#### PACKAGES

The most suitable package to be used by a section or by an individual grower in marketing peaches, depends upon the varieties grown, the method of transportation to market, the relative costs of the packages, market preferences and conditions, and the kind of labor available. The bushel basket, the 6-basket carrier, the  $\frac{1}{2}$ -bushel basket, the 16-quart and 20-quart hampers, and the western box are

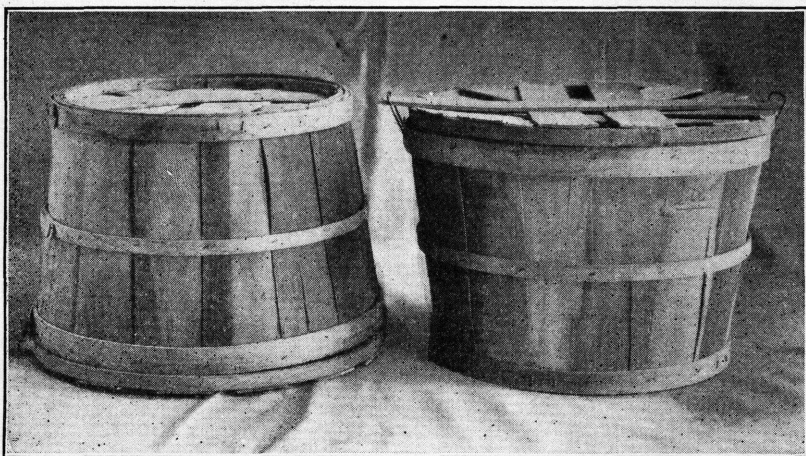


FIGURE 6.—The straight-side bushel basket is the container most used in marketing peaches

the principal containers used in marketing the peach crop. The  $\frac{1}{4}$ -bushel basket is also used to a limited extent.

#### THE BUSHEL BASKET

The straight-side bushel basket or tub is the most widely used. (Fig. 6.) Bushel baskets used in shipping peaches were formerly of the rounded-bottom stave type, and this type of basket is still used to some extent. The straight-side basket has become more popular because it is more rigid and is well adapted to use with mechanical packing devices. Shipments to middle-western markets from the South are mostly in bushel baskets that are popular in the Middle West. They are suitable for the Elberta, the principal commercial variety in most peach-growing areas.

The bushel basket has been used almost exclusively in the middle-western producing areas, in western New York and in Texas and Oklahoma, but the  $\frac{1}{2}$ -bushel basket has recently come into general use. In Georgia and the Carolinas the bushel basket is generally

used, particularly for the midseason and late varieties. It is the principal container in Tennessee and the Middle Atlantic States and in the Rocky Mountain States.

A corrugated paper cap is placed under the cover to protect the fruit from bruising. The cap is placed with the smooth side next to the fruit, and should be slightly larger than the cover itself so that the peaches around the outside of the top layer will be protected from injury by pressure of the cover.

The bushel basket is cheaper than the 6-basket carrier and can be packed more rapidly and cheaply with the aid of mechanical packing devices.

#### THE 6-BASKET CARRIER

The 6-basket carrier was used almost exclusively in Georgia for 25 years, but has given way to a considerable extent to the bushel basket.

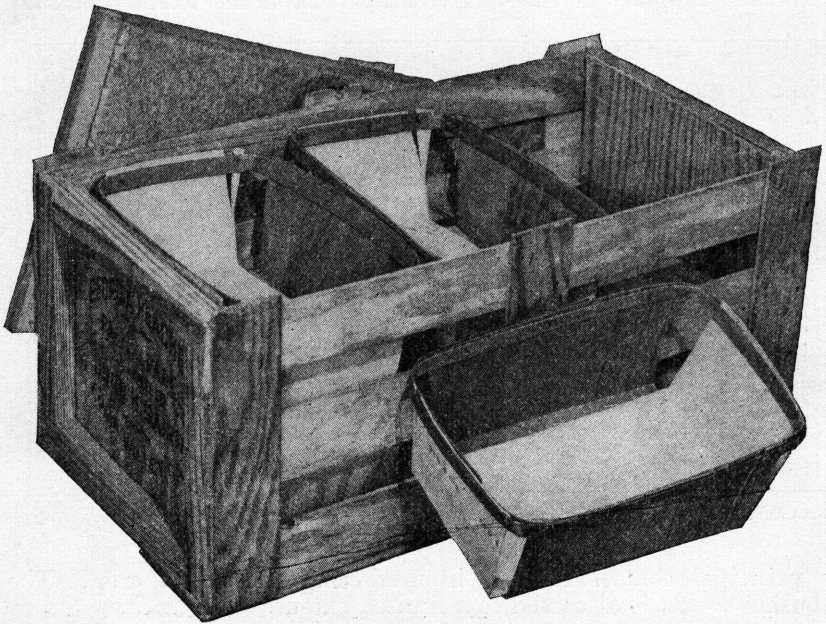


FIGURE 7.—The 6-basket carrier contains six 4-quart till baskets

It is widely used in the Carolinas and to some extent in the Middle Atlantic States. The carrier is especially suitable for shipping the early tender varieties, including Carman, Hiley, and Belle. Peaches put up in this package are well protected, receive careful handling in packing, and are attractively displayed.

The carrier contains six 4-quart till baskets, placed in two tiers, with a dividing tray to prevent the fruit in the lower tier from being bruised by the pressure from the upper baskets. (Fig. 7.) It is 22 inches long, 11 inches wide, and 10 inches deep, inside measurements, although a crate with a 10½-inch depth has been used to a limited extent in a few States, as Maryland and New Jersey. As the till baskets are the same size in crates of both depths, it is easier to obtain a high bulge to the pack in the shallower crate. However, on the



10-inch crate cleats are used to raise the lid; with the 10½-inch crate no cleats are used. A reasonably high pack is desirable to offset the settling in transit and to hold the fruit tightly in place.

To protect the peaches on the top of the package, pads made of excelsior covered with wrapping paper are placed over the fruit. These pads are sometimes sold attached to the covers, but they can be bought separately. Corrugated-paper pads are used by some shippers. Excelsior pads or cushions are recommended, as careful observations have shown that packages so equipped arrived in the market with much less bruising of the fruit.

The use of the carrier encourages more careful sorting than is commonly practiced when the fruit is packed without any definite order of arrangement. Each peach is handled separately by the packers, thus affording an added opportunity to sort out the overripe and defective specimens. The arrangement of the fruit in the basket contributes to the attractiveness of the package, and minimizes the danger of bruising. The open spaces between the baskets permit a free circulation of air and facilitate refrigeration in transit.

The principal objection to the carrier is that packing it is slower and more expensive than packing the bushel basket. In Georgia this work was formerly done entirely by professional orange and tomato packers from Florida, but local help is employed extensively now. The use of mechanical packing devices for the bushel basket and the labor situation have been important factors in bringing about the use of the bushel basket in the region where the carrier was formerly employed almost exclusively.

In the Middle Atlantic States the carrier has been used to a considerable extent as a shipping package for all varieties that are shipped before the Elberta and for a part of that crop as well. The carrier has not been popular in western New York, in Ohio, Oklahoma, Texas, and some other sections where the Elberta is the leading variety, because this peach can be shipped in bushel baskets with little injury and at a relatively small cost for packing.

#### THE ½-BUSHEL BASKET

One-half-bushel baskets have come into use in various peach-producing areas. These baskets are usually of the straight-side type and offer satisfactory protection to the fruit. Because of the smaller quantity, consumers frequently buy the entire half bushel as a unit.

#### THE ¼-BUSHEL OR PECK BASKET

In Georgia, and possibly in some other sections, a few shipments have been made in peck baskets. This is a consumer package and may have some merit in stimulating sales. The cost of containers and packing is relatively high when the peck basket is used.

#### THE HAMPER

Some 16-quart and 20-quart or ⅝-bushel hampers are used in the Middle Atlantic States, particularly New Jersey and Delaware. Their use is restricted largely to roadside and local sales. A few are used in shipments to nearby markets.



## THE WESTERN BOX

The western box is used in shipping fresh peaches from California and Washington, and to some extent in other Western and Rocky Mountain States. Its inside dimensions are  $11\frac{1}{2}$  inches wide by 18 inches long, and its depth ranges from  $3\frac{1}{2}$  to 5 inches, but is usually from 4 to  $4\frac{3}{4}$  inches. The box, which is always lidded, offers good protection to the fruit and is an attractive display package.

A lug box is also used in California and Washington. Its inside dimensions are  $13\frac{1}{2}$  inches wide by  $16\frac{1}{8}$  inches long and  $5\frac{3}{4}$  inches deep. It is sometimes used without a lid. The lug is especially adapted to large-sized fruit, for two layers can be packed without using several cleats under the lid.

## PACKING EQUIPMENT

## SIZING MACHINES

In most of the important commercial peach-producing areas sizing machines are in general use, although hand sizing is still practiced extensively, particularly in the smaller orchards.

In the Georgia peach districts practically all packing houses are equipped with sizing machines. In Arkansas sizing machinery is used only in the packing houses at the larger orchards. In one district in Virginia hand sorting and sizing is practiced in slightly more than half the packing sheds. Most of the sizing and sorting is done by hand in Utah. In some areas where apples as well as peaches are grown—as in Indiana, western New York, and Colorado—apple-sizing machinery, usually with some modifications, is frequently used to size peaches. In Washington much of the sizing is done by hand, but apple-sizing machinery or special sizing machinery is used in some of the larger packing sheds.

Under ordinary circumstances fruit may be sized more rapidly and accurately by machinery than by hand and, if the volume is sufficiently large, at considerably less cost.

In the United States standards for peaches the size is based on the minimum diameter taken through the center and at right angles to a line running from stem to blossom end. Most machines are designed to size the peaches according to this minimum diameter.

Since the peach is easily damaged by rough handling, it is essential that the machine be designed to handle the fruit with a minimum amount of bruising.

Several types of sizing machines are in use. The sizing mechanism in a widely used and popular type consists essentially of a rotating roller with a rope belt parallel to the roller and moving along a guide. The roller has offsets at intervals so that the smallest peaches fall through between the roller and the rope first, and the next larger size fall after the first offset on the roller is reached. The roller rotates so as to tend to lift and turn the peaches as the moving rope tends to carry them along the roller. (Fig. 8.)

After the peaches are sized they may go into canvas or padded chutes for packing or may be transferred by canvas conveyors to shallow packing bins.

These machines frequently have 2, 4, or 6 rollers. The manufacturer claims a capacity of 2,000 to 3,000 bushels per 10-hour day for

a machine of the 4-roller type. The over-all length of a popular 4-roller model, including hopper and sorting conveyor, is 24 feet with an over-all width of 40 inches.

A view of the sizing mechanism in another type of sizing machine is shown in Figure 9. The sizing mechanism consists of rollers operating in pairs. The rollers marked A are spaced at regular intervals; those marked B are mounted to swing in arcs and they cooperate with the spaced rollers to define the size of the opening. As the belt is carried forward these rollers are progressively lowered

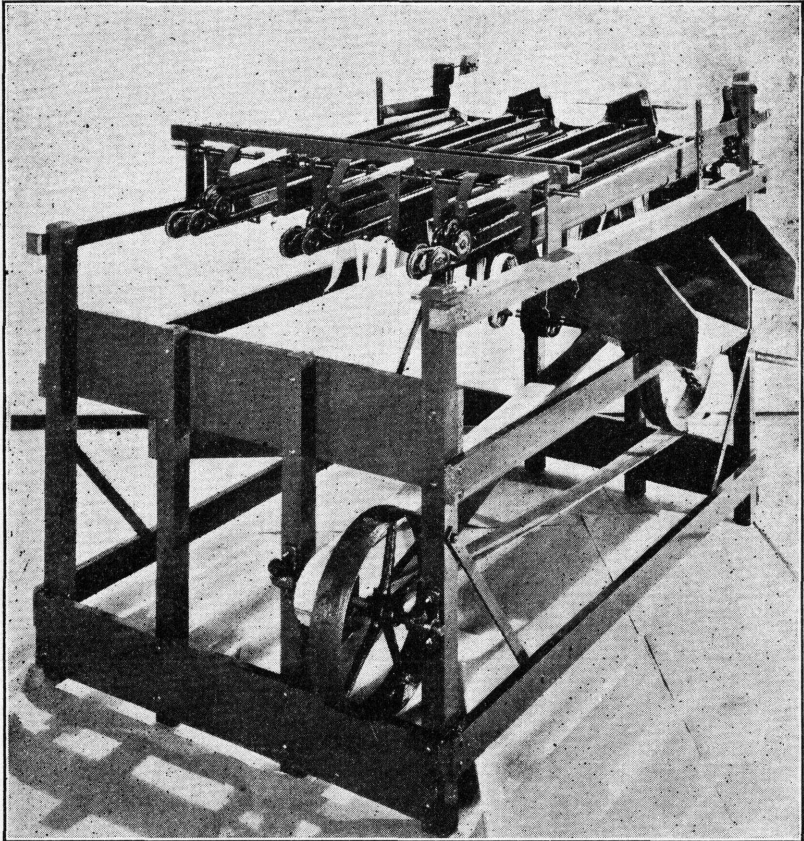


FIGURE 8.—In this type of peach-sizing machine the sizing mechanism consists essentially of rotating rollers which are offset at intervals. Rope belts moving along the side of the rollers carry the fruit forward

by means of the steps shown at points C, thus increasing the size of the opening through which the peaches may be discharged to the distributing belts at point D. The distributing belts carry the various sizes to the packing bins. Such machines are built in different lengths, but the most popular size accommodates 15 packers and has about 36 feet of bin space.

The United States Department of Agriculture has developed a machine that is used in various sections. This machine is described in detail in Department Bulletin 864, A Peach Sizing Machine. It

does the sizing by means of diverging ropes. Apparatus employing the diverging-rope principle in sizing is used considerably in the Northwest. A few other types of sizing machines are used in various sections.

Sizing machines are equipped with conveyors which carry the peaches from the hopper, or from the place where they are transferred from the field boxes or baskets, to the sorting and sizing machine. The culls are picked off the conveyor before the fruit reaches the sizing apparatus. The most popular type of conveyor consists of rollers placed close together and at right angles to the direction in which the conveyor moves. These rollers rotate as they move along and turn the peaches slowly so that the sorters can see the entire surface of each peach and remove defective specimens. In some instances the conveyors are made of canvas belting.

Machines may be equipped with cull chutes or conveyor belts to carry away the inferior fruit. A center section of the conveyor may

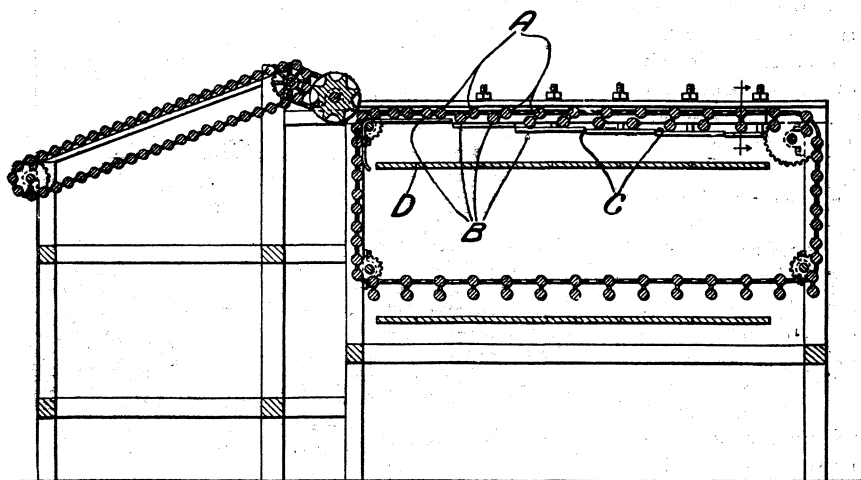


FIGURE 9.—In this type of machine the sizing mechanism consists of rollers operating in pairs. In this sectional view A and B are the sizing rollers; C marks the steps that permit enlarging the openings; and D, the distributing belt

be divided off by strips or boards placed lengthwise and this center portion, provided with a chute at the end, can be used for cull disposal. With this arrangement sorters can remove the culls without taking their eyes off the passing fruit.

Where two or more grades of fruit are packed, as United States Fancy, United States No. 1, and United States No. 2, the United States Fancy and United States No. 2 are picked off the main conveyor and either placed in containers beside the sorters or placed on conveyor belts to be carried to one end. The fruit thus sorted out can be sized separately.

In some sections in which considerable hand sizing is done, tables consisting of a frame that is lower at one end than the other and having a canvas top, are sometimes used. The peaches are moved from the higher to the lower end partly by gravity and partly by hand, and defective and undersized stock is removed during the operation.

## DEVICES FOR PACKING BASKETS

The several devices used in packing bushel baskets have helped to bring about the popularity of this package. The straight-side type of basket is better adapted to use with these devices than is the round-bottom type. In most packing houses in districts where the bushel basket is used these devices are a part of the equipment. They are also used in packing the  $\frac{1}{2}$ -bushel basket.

A popular type is illustrated in Figure 10. It consists of (fig. 10, A) a metal-facing form with concentric grooves or depressions spaced according to the size of the fruit to be packed, on which peaches are arranged for the top layer or face of the pack. There is also a metal packing shell which will just fit inside the basket. This shell, with a heavy paper liner inside, is placed on the facing form after the face is laid and is filled by allowing the peaches to run gently from the packing bin. The packing shell is then removed, allowing the heavy paper liner to hold the pack in place. (Fig. 10, B.) The basket is then placed down over the pack. (Fig. 10, C.)

A special device is often used to facilitate turning the packed basket to an upright position. (Fig. 10, D.) This consists essentially of two frames or racks each constructed of two metal strips bent at right angles and hinged to a crossbar at the center of a stand or table. The height of the crossbar above the surface of the stand is equal to half the height of the basket. The facing form, with the packed basket in an inverted position resting on it, is placed on the frame or rack at one end of the stand. The other rack is held tightly against the bottom of the basket. By means of this device the facing form is held tightly in place as the basket is brought to an upright position, so that the face of the pack is not disarranged. The facing form is then removed, and the basket is ready to have the cover attached. (Fig. 10, E.)

In another type of device the packing shell, instead of being solid, consists of thin metallic fingers. A facing disk, which may have a circular piece of felt in the center, fits inside the shell. (Fig. 11.) The paper liner for the inside of the basket can be eliminated if this device is used. After the face is laid and the shell is filled, the basket is inverted over the pack. The pack is brought to an upright position and the packing shell is then pulled out. While the packing shell is being withdrawn, the facing disk is held in position on the face of the pack to prevent disarrangement of the face.

Under one system of packing, the face of the pack is laid directly in the cover of the basket. A metal shell, with a heavy paper liner inside, is placed on the cover after the face is laid. The shell is then filled and the liner holds the pack in place after the shell is removed. A special press is used to bring the basket down tightly over the pack while the cover is fastened to the basket with flat hooks. (Fig. 12.) The completed pack, made under this method, is shown in Figure 13.

Under another method of packing, a basket with a removable bottom is used. The cover is attached to the basket, and if paper caps or liners are used they are put into position through the open bottom. The inverted basket should be placed on blocks or on a raised ring so that the cover does not rest flat on the table. The



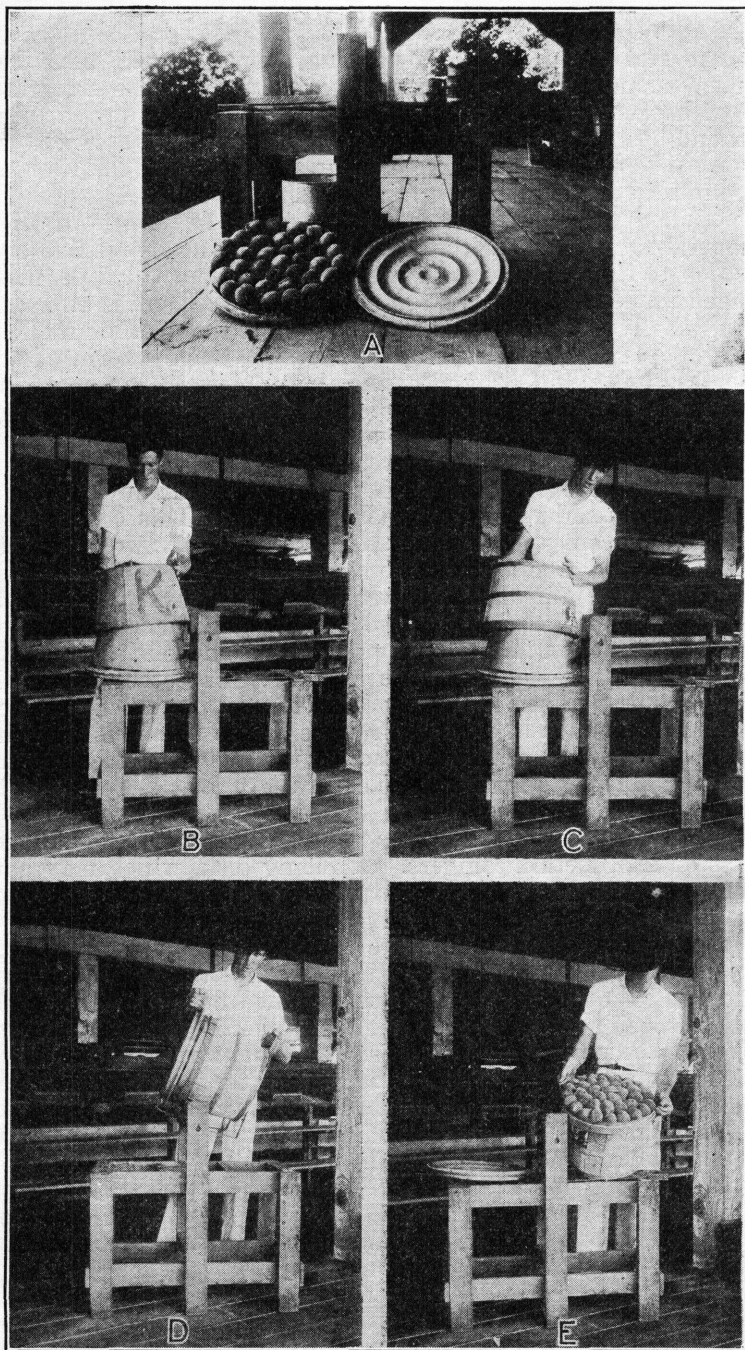


FIGURE 10.—Under this method of packing the basket, the face is first laid in a facing form (A). After the shell and liner have been placed on the facing form and filled from the bin, the shell is removed, the paper liner holding the contents in place (B). The basket is then placed over the pack (C). The basket is brought to an upright position (D). The facing form is then removed (E).



facing layer is then laid through the open bottom; it consists of uniformly sized fruit with the colored sides of the peaches placed down. The colored sides of the peaches in this facing layer will be on top when the pack is completed. The basket is then filled level full and should be shaken several times during the process. After a bottom pad is placed over the fruit the bottom of the basket is fastened on. (Fig. 14.)

#### MISCELLANEOUS EQUIPMENT

A few growers in various sections use devices for removing the fuzz from peaches. These machines are usually placed just ahead of the sizing apparatus.

In one type of cleaning or "defuzzing" machine rotating brushes over which the fruit passes turn the peaches rapidly against suspended stationary brushes. No adjustment because of variation in size of the fruit is necessary. (Fig. 15.) In another type of fruit-cleaning apparatus which can be used for defuzzing peaches the fruit passes between rotating brushes and soft cloth buffers rotating above the brushes. In both types of machine an exhaust piping and fan create suction to remove and carry away the fuzz.

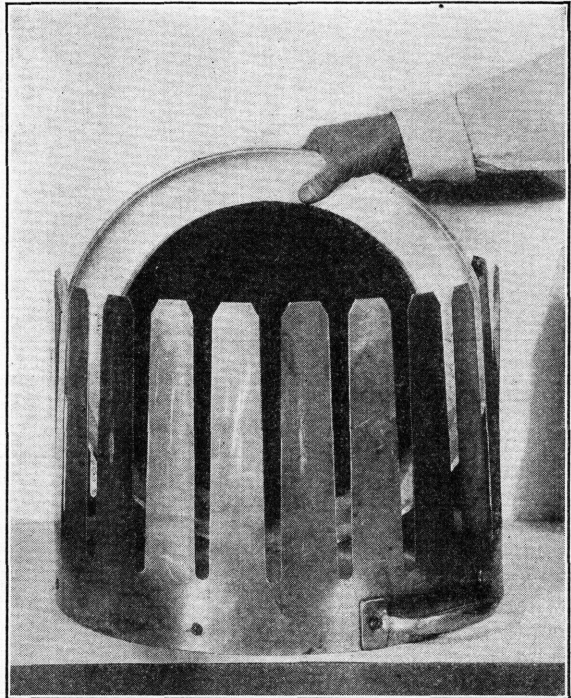


FIGURE 11.—In this type of basket-packing device, the packing shell has thin metallic fingers

The end view of a packing bench used in packing 6-basket carriers is shown in Figure 16. This bench is designed for hand sorting and sizing of the peaches from the field basket into the bin in the top of the bench. The bench upon which the crate is placed should be 27 inches from the floor. The height of the lower side of the bin is about 38 inches. The bins are about 2½ feet long and about 24 inches wide and are made of burlap, ticking, or canvas; in some instances they are supported by wire screen. All parts of the bin that are likely to cause bruising should be padded. There should be a sufficient slope toward the packer to permit the fruit to roll gently toward him.

Where sizing machines are used the peaches can be delivered into shallow bins from which the containers can be packed. (Fig. 17.)



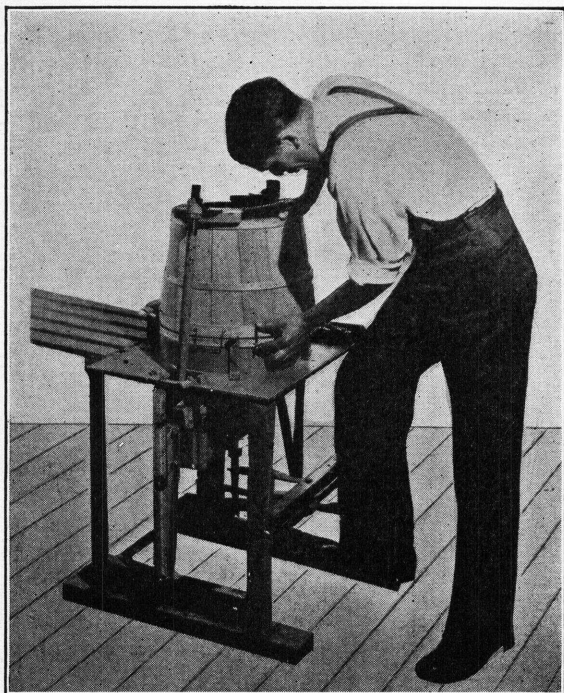


FIGURE 12.—Under this method of packing baskets a press is used to bring the basket tightly down over the contents while the cover is attached

in moving packed baskets.

Benches for use in nailing covers on 6-basket carriers are necessary equipment where this type of container is used. The most common form of nailing bench consists of a low, heavily built bench large enough to hold from four to six crates and provided with cleats upon which the ends of the crates rest. These cleats raise the crate high enough to allow the bottom to bulge when the top is

Hand trucks for moving the packed fruit into the car are part of the equipment in modern packing houses.

Chain conveyors are used for carrying the packed crates to the nailing bench in many houses where crates are packed. Such a conveyor can be run with the same power unit that operates the sizer and generally is a desirable part of the packing-house equipment. The conveyor should be equipped with an automatic stop to prevent an accumulation of crates at the nailing benches. (Fig. 18.) With modifications this conveyor can be used

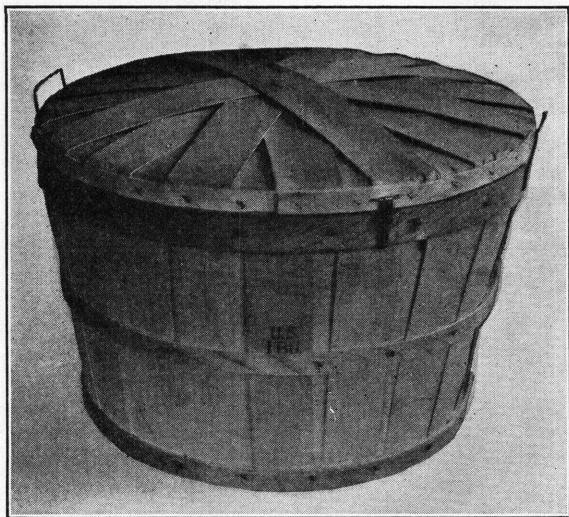


FIGURE 13.—The face of this pack was laid directly in the cover. The basket was brought into place with a press while the flat hooks that hold the cover were put in position



nailed on. If crate conveyors are used the nailing benches are located in the center or at the end of the house; otherwise they are placed at a distance most convenient to the packers.

Crate or basket chutes for moving the empty containers from the loft to the packing floor are aids in efficient operation. (Fig. 19.) The empty containers can be delivered near the packing benches at about the height of the packer's head. The chutes can be kept filled by boys working in the storage loft.

If 6-basket carriers are used, shelves to hold the partitions or dividing trays and baskets should be placed just above the packing bins at about the height of the packer's head.

#### OPERATION OF A PACKING HOUSE

Competent and careful supervision is necessary in the successful operation of a peach-packing house. In some of the southern peach districts professional managers frequently are employed; they travel from place to place with the progress of the fruit season.

Formerly, when most of the southeastern crop was shipped in 6-basket carriers, most of the packing was done by professional packers, but during recent years much of it has been done by local help. Local help, when properly trained, frequently is more satisfactory than itinerant labor, being more easily handled and more responsible. Much of the sorting and packing can be done by girls.



FIGURE 14.—Under this method of packing the removable bottom of the basket is placed in position after the peaches have been packed through the open bottom

#### MOVEMENT OF THE FRUIT THROUGH THE HOUSE

The arrangement of the equipment in a packing house will depend on local conditions. Usually the driveway for trucks or wagons delivering the fruit from the orchard will be along one side of the house and the railroad tracks or driveway for removing the packed fruit along the other side. The fruit, therefore, usually moves across the width of the house. The arrangement of equipment in a typical Georgia peach-packing house is shown in Figure 20.



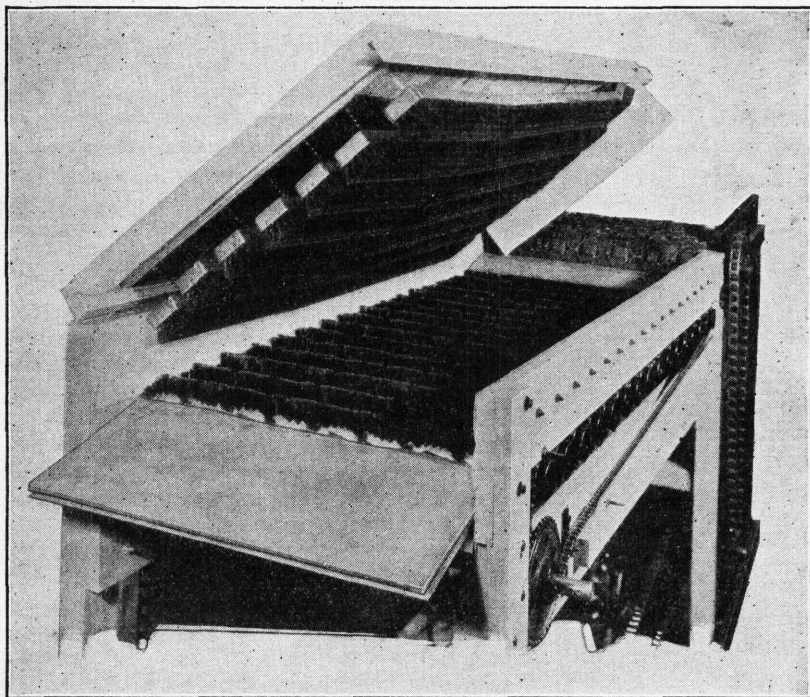


FIGURE 15.—In this type of cleaning or defuzzing machine rotating brushes turn the peaches rapidly against suspended stationary brushes

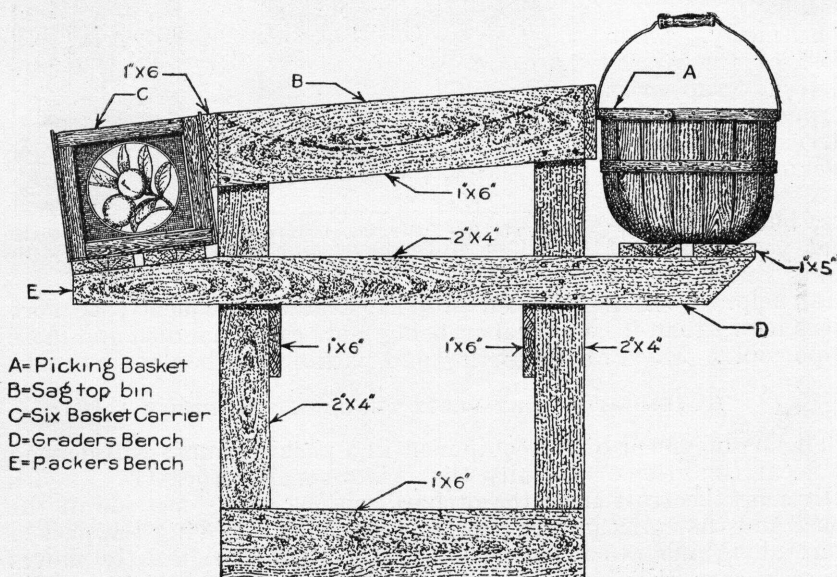


FIGURE 16.—End view of a peach-packing bench: A, Picking basket; B, sag-top bin; C, 6-basket carrier; D, grader's bench; E, packer's bench



It is desirable that the peaches be moved along as rapidly as possible in the packing process because deterioration is rapid. The fruit should not be exposed to the hot sun, and when delivered from the orchard it should be placed as near as possible to the place at which it

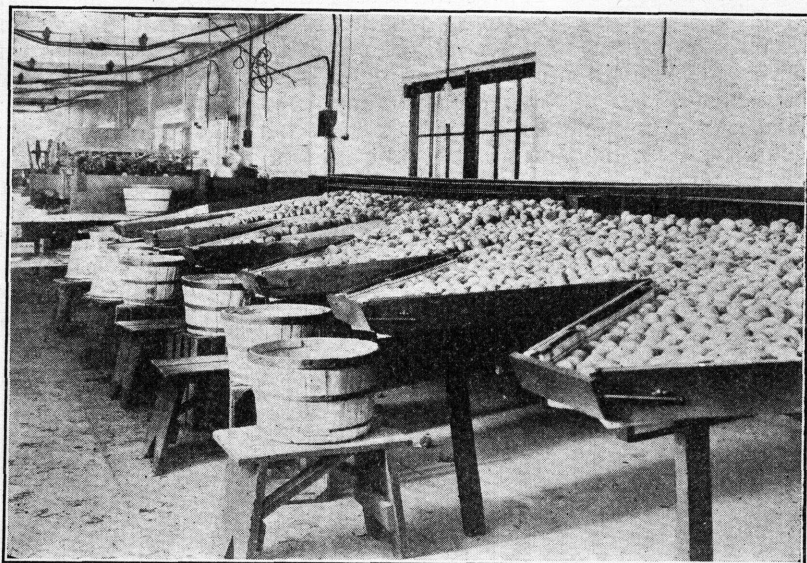


FIGURE 17.—Peaches can be conveniently packed from shallow padded bins to which they are distributed from the sizing machine

will enter the grading and sizing machine. If the peaches are hauled from the orchard in baskets and the baskets must be piled more than one tier deep on the floor of the packing shed, the upper tier should rest on the edges of the baskets in the lower tier to prevent bruising.

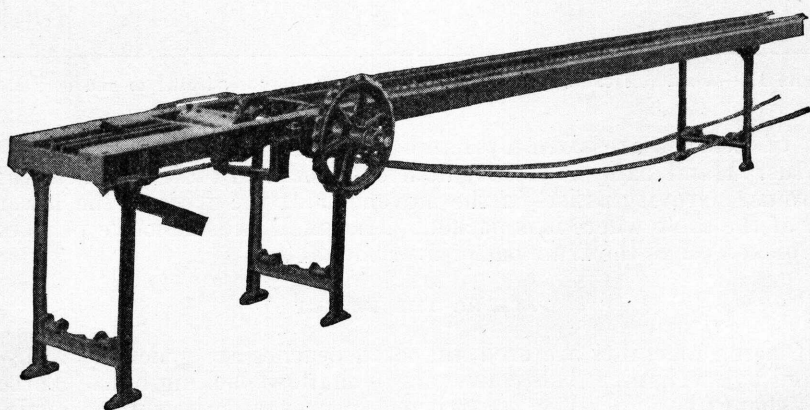


FIGURE 18.—A conveyor used to carry packed crates to the nailing bench. It is equipped with an automatic stop

#### SORTING

If sizing machines are used, the peaches as they come from the orchard are emptied into the feeding hoppers of the machines.



Tickets placed in the field containers to identify the pickers are collected as the containers are emptied. As the peaches pass over the conveyor before reaching the sizing apparatus the defective peaches are picked out. Both roller and belt types of conveyors are used, but the roller type is more generally used. The rollers are so constructed as to turn the peaches over so that the sorters have an opportunity to see all defects. The number of sorters necessary depends upon the capacity of the machine, the quality and condition of the fruit, and the grades that are being packed. It is extremely important that the sorters thoroughly understand the exact nature of the defects that must be wated for and removed. Constant supervision of the sorting is usually necessary to insure a uniform and satisfactory pack.

Sizing machines are in general use in packing peaches in commercial orchards, but in many producing areas considerable quanti-

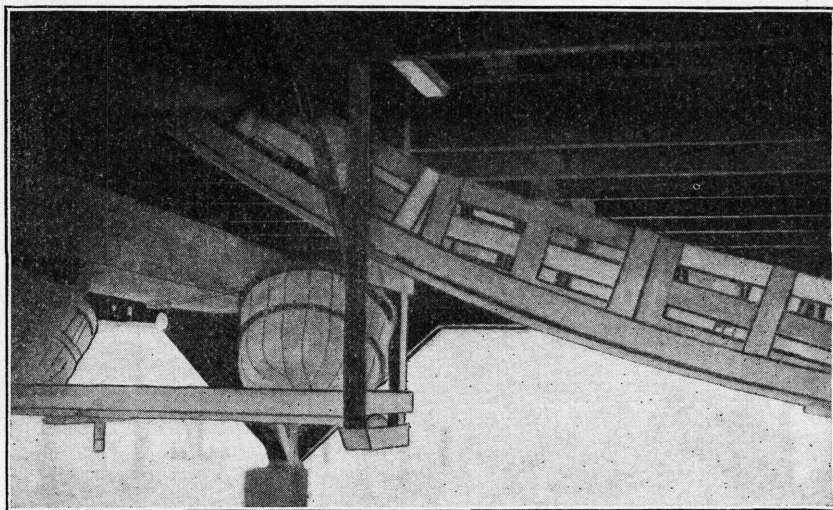


FIGURE 19.—A suitable chute for empty containers which runs parallel to and over the packing benches

ties of peaches are sized by hand, particularly at the smaller orchards. Hand sizing is usually done over inclined tables with canvas bottoms. Gravity assists in the movement of the fruit to the lower end of the table where it is packed. The small and defective peaches are picked off as the fruit passes over the table.

#### PACKING THE BASKET

If sizing machines are used, the sized peaches are generally transferred by mechanical belt conveyors to shallow packing bins. These bins should be padded or constructed to prevent injury from bruising. If mechanical devices for packing bushel or half-bushel baskets are used, the number of facing forms and packing shells necessary depends, of course, on the volume of peaches being packed. Girls are often employed to select the peaches from the bins and ar-

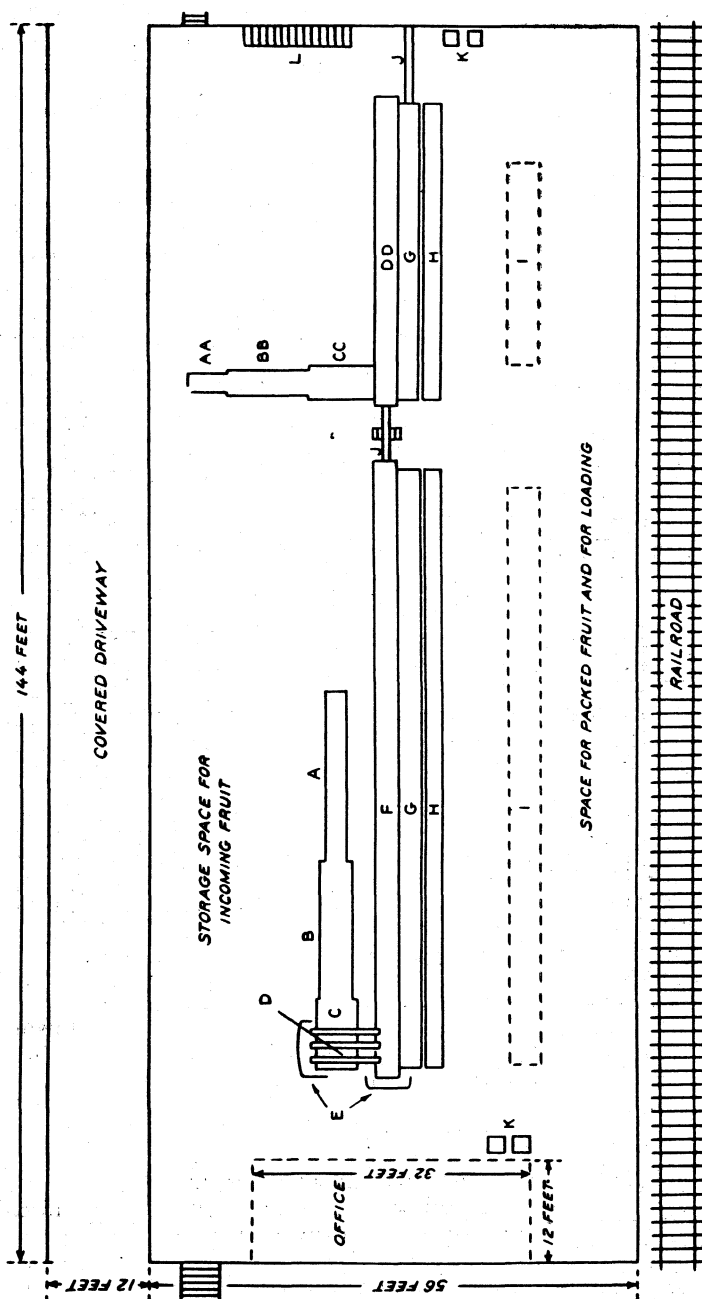


FIGURE 20.—Floor plan of one type of southern peach-packing house with two sizing machines: A, Feed belt (also used as grading belt) 20 feet by 2 feet 6 inches; B, roller elevator, 19 feet by 3 feet 4 inches, for grading; C, sizing machine; D, 3 conveyor belts, 7 feet by 1 foot, from sizer to main belt; E, guard rails; F, conveyor belt, 72 feet by 2 feet 6 inches, to bins; G, packing bins; H, bench to hold crates or packing shells while being filled; I, lidding benches or portable tables for completing basket packs; J, hull belt, 1 foot wide, running under main belt or bins; K, elevator from second floor for containers and covers; L, stairway to second floor; AA, feed belt, 5 feet by 2 feet 6 inches; BB, roller elevator, 10 feet by 3 feet 4 inches, for grading; CC, sizing machine; DD, conveyor belts to bins, 36 feet by 2 feet 6 inches

range them in the facing forms. The fruit must be arranged tightly in the facing form.

If the same facing forms are used in packing peaches of different sizes, in order to obtain a tight face it may be necessary to place the smaller peaches with their longest diameter crosswise of the depressions in the facing form. In packing larger peaches the fruit is laid with the longest diameter lengthwise in the depressions in the facing form. If the face is laid in the basket cover the operation is similar.

The facing forms are placed on benches beside the packing bins while the face is being arranged. The packing shell and liner are then placed on the face and the fruit from the bin allowed to run gently in. A canvas apron attached to the bin helps to prevent bruising. When partly filled the shell should be shaken or racked to settle the peaches and insure a tight pack. The filling is done by men.

The filled shell, with facing form attached, is then carried to a near-by bench where men place the basket over the packing shell and complete the packing. Care should be exercised in turning the basket from the inverted to the upright position. If the filled basket is brought down with too much force there is danger of bruising the fruit.

The pack is usually stamped with the variety and size of the peaches, and the packed baskets are placed in position to be conveniently loaded on a car or truck.

The size of the fruit stamped on the basket is the minimum transverse diameter, taken at right angles to a line running from the stem end to apex of the peach. A common practice in the South is to pack in three sizes, the dimensions of which depend on the variety and the average size of the fruit as it comes from the orchard. In Georgia the general practice is to use size ranges of one-eighth inch for fruit under 2 inches in diameter and ranges of one-fourth inch for fruit over 2 inches in diameter. The minimum sizes in general use are in terms of inches,  $1\frac{1}{2}$ ,  $1\frac{5}{8}$ ,  $1\frac{3}{4}$ ,  $1\frac{7}{8}$ , 2,  $2\frac{1}{4}$ ,  $2\frac{1}{2}$ , and  $2\frac{3}{4}$ . Elbertas of good size would be classified thus: 2 to  $2\frac{1}{4}$  inches,  $2\frac{1}{4}$  to  $2\frac{1}{2}$  inches, and  $2\frac{1}{2}$  inches and up. It has been the practice to mark these packs 2-inch minimum,  $2\frac{1}{4}$ -inch minimum, and  $2\frac{1}{2}$ -inch minimum. Stamping the actual size range on the pack would be more accurate.

If baskets are packed through a removable bottom or the face of the pack is laid directly in the cover, the operations are varied accordingly. A few growers put up a solid-ring basket pack in which not only the face but all peaches in the basket are arranged in layers and in concentric rings. Observations have shown that there is little benefit in solid-ring packing so far as the protection of the fruit is concerned, and this method increases the cost considerably.

Only in the smaller orchards are peaches still packed in baskets without the aid of mechanical devices. When the baskets are packed by hand they should be racked or shaken once or twice while they are being filled, to obtain a tight pack. A shaker consisting of a circular, slightly concave device which fits inside the basket is often used in obtaining a proper surface on which to lay the ring face. The top or facing layer of peaches should extend about one-



half inch above the top hoop of the basket and about 1 inch higher in the center. In some sections a shallow paper pan is placed in the basket when it is filled up to the facing layer, and the face is then laid in this pan.

#### PACKING THE 6-BASKET CARRIER

When packing the 6-basket carrier, it is placed on a bench in front of the packing bins. The packer, using both hands, reaches over it for the fruit in the bins, thus working with a minimum amount of effort. Each tier of baskets in the container should be filled one layer at a time. If one basket is completely filled before the others are started the thin veneer sides may be bulged out and the remaining baskets pressed out of shape. When the bottom baskets are finished the dividing tray is put in and the upper baskets are packed in the same manner as the lower tier. It is essential that the peaches in each layer fit tightly in order to reduce to a

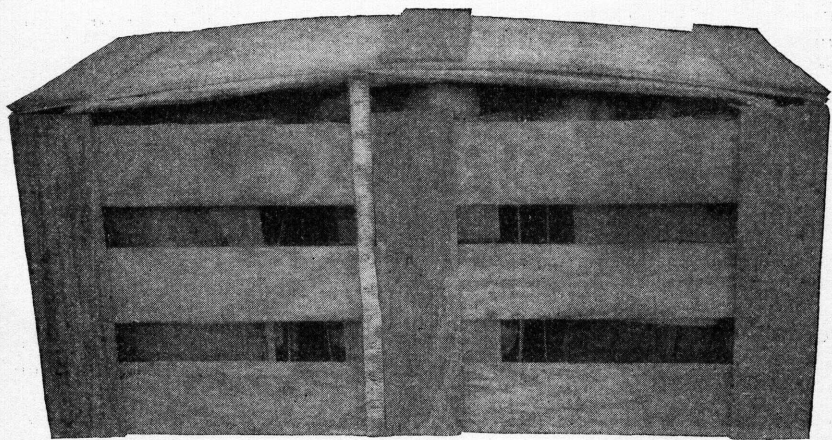


FIGURE 21.—Packed 6-basket carrier of peaches showing a proper bulge

minimum the amount of settling in transit. To further counteract this settling the crates should be packed high enough to give a good bulge.

The exact height of the bulge will vary to some extent with the size of the peaches, the larger sizes generally showing a higher bulge than the smaller, but a good tight pack should have a bulge of from  $1\frac{1}{2}$  to 2 inches. (Fig. 21.) The most common difficulty is to get the pack high enough, but some growers go to the other extreme and pack the crate with too much bulge, which is likely to cause excessive bruising. A slack pack is likely to give trouble, as the fruit is generally so shaken up in the car while in transit that the order of arrangement, which is one of the principal advantages of this type of package, is disturbed. The pack should be slightly lower at the ends than in the center, and the surface should be smooth, so that the cover will touch each peach with equal pressure. The diagonal system is used in all the standard packs, permitting less



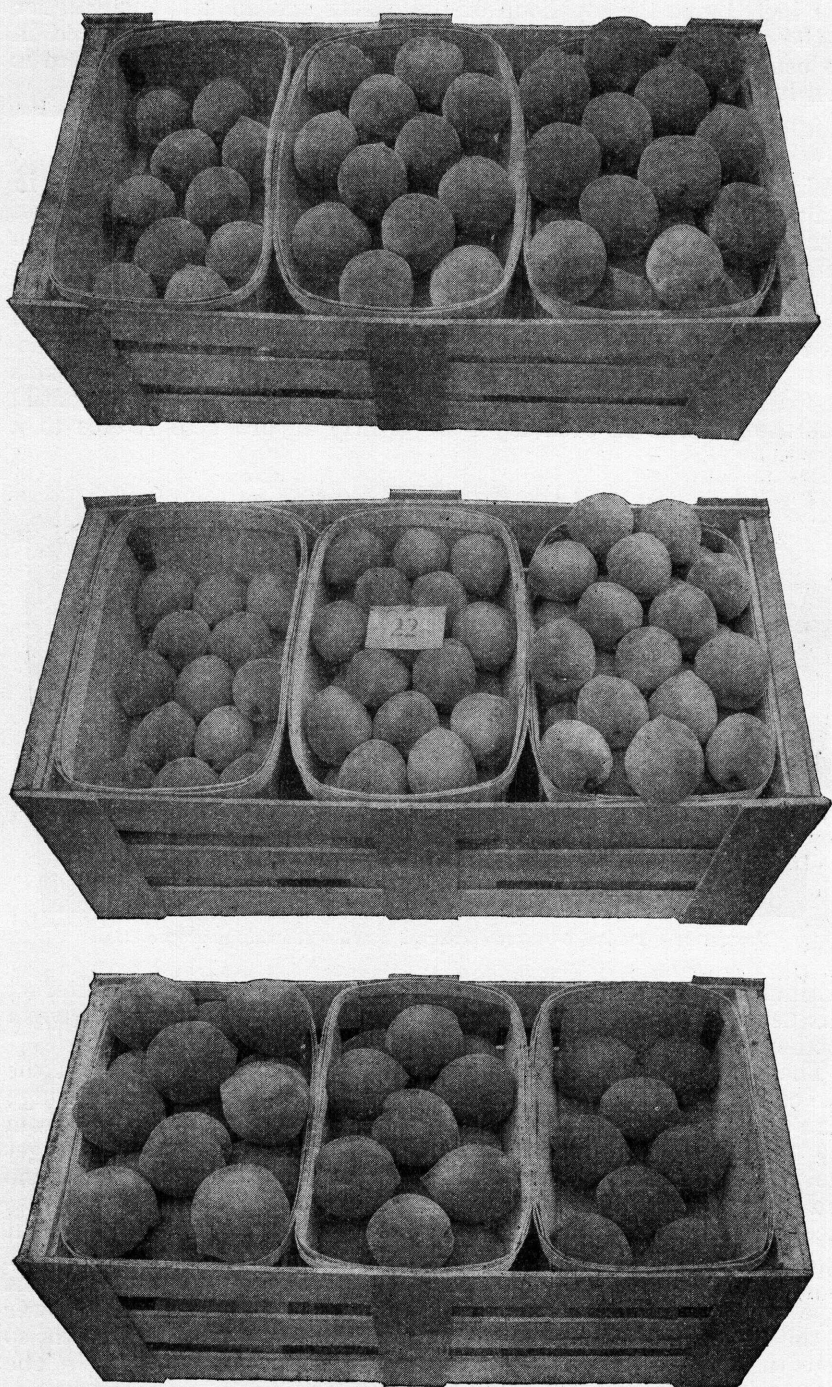


FIGURE 22.—Above, 2-2 pack; middle, 3-2 pack; below, 2-1 pack

likelihood of bruising the fruit than do straight packs in which the peaches in the upper layer rest directly on those below. (Fig. 22.)

The following packs are in general use for Georgia peaches in 6-basket carriers:

Peaches		Peaches	
2-1 pack, 6 layers, 108 peaches:		2-2 pack, 6 layers, 204 peaches:	
Bottom layer-----	6	Bottom layer-----	10
Middle layer-----	6	Middle layer-----	12
Top layer-----	6	Top layer-----	12
Total-----	18	Total-----	34
2-1 pack, 6 layers, 138 peaches:		3-2 pack, 6 layers, 258 peaches:	
Bottom layer-----	8	Bottom layer-----	13
Middle layer-----	7	Middle layer-----	15
Top layer-----	8	Top layer-----	15
Total-----	23	Total-----	43
2-1 pack, 6 layers, 162 peaches:		3-3 pack, 6 layers, 306 peaches:	
Bottom layer-----	9	Bottom layer-----	15
Middle layer-----	9	Middle layer-----	18
Top layer-----	9	Top layer-----	18
Total-----	27	Total-----	51
2-2 pack, 6 layer, 180 peaches:			
Bottom layer-----	10		
Middle layer-----	10		
Top layer-----	10		
Total-----	30		

A few very large peaches are also put up in a 2-1 pack with 5 layers. Terms in general use to indicate the size of peaches packed in 6-basket carriers are: 2-1, 5 layers, very large; 2-1, 6 layers, large; 2-2, 6 layers, medium; 3-2, 6 layers, small; 3-3, 6 layers, very small.

After the carrier or crate is packed it is passed to the man who nails on the cover. A protecting pad is usually put over the top layer before the cover is placed on the crate. The crate is then stamped with the variety, grade, and size of peaches. Labels showing the brand, and the name and address of the shipper are usually pasted on the ends of the crates. The men who put the crates together and nail on the covers are usually experts and frequently travel from one producing section to another as the season progresses. Professional packers usually put up 125 to 150 crates a day and some pack as many as 200 crates a day under favorable conditions.

If it is necessary to stack the packed crates more than one layer high on the packing-house floor before loading them on the car or truck, strips of lumber about 2 inches thick should be laid across the ends of the crates for the upper layer to rest on in order to prevent bruising of the peaches under the bulge of the cover. The crates should not be placed on their sides as this may disarrange the peaches in the baskets.

#### PACKING THE BOX

In the Western States the box (p. 12) is used. In many western orchards the fruit is sorted and sized by hand on inclined tables



with canvas or padded bottoms or in square canvas-bottomed bins. In the latter case the small and inferior fruit is sorted out as the peaches are transferred from the field containers to the bins by hand. The packer sizes the peaches as he packs from the bin.

Sizing machinery is used to some extent in the centralized packing houses or large individual houses. The fruit is wrapped in paper as it is packed in the boxes, which are placed on a bench in front of the bin or hand-sorting table. (Fig. 23.) The wrappers, which may be of tissue paper, should be strong enough not to tear easily. The wrapper is usually from 8 to 10 inches square, depend-

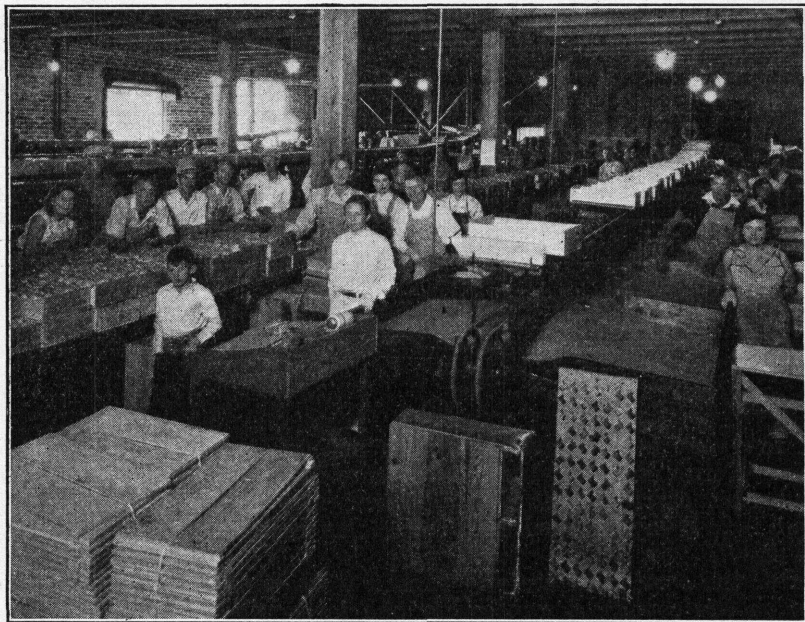


FIGURE 23.—Interior of a large northwestern peach-packing house where the fruit is packed in boxes

ing on the size of the peaches, and frequently has a design or brand printed on it. The method of wrapping is similar to that employed in wrapping boxed apples.

The fruit is usually so placed in the box that the peaches in alternate rows are not directly opposite each other but fit as far as possible into the space between the peaches in the next row. The peaches in the second layer are not placed directly over those in the first layer. This is called a diagonal pack because of its appearance. (Fig. 24.)

Table 1 shows the arrangement of peaches of various sizes in the box packs.

TABLE 1.—Arrangement and number of peaches packed in boxes

Peaches in adjacent rows		Layers in the box	Peaches in the box	Peaches in adjacent rows		Layers in the box	Peaches in the box
Crosswise of the box	Lengthwise of the box			Crosswise of the box	Lengthwise of the box		
<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>
3-3	8-8	2	96	2-3	6-6	2	60
3-3	8-7	2	90	2-3	6-5	2	55
3-3	7-7	2	84	2-3	5-5	2	50
3-3	7-6	2	78	2-3	5-4	2	45
2-3	8-7	2	75	2-3	4-4	2	40
3-3	6-6	2	72	2-2	4-5	2	36
2-3	7-7	2	70	2-3	4-3	2	35
2-3	7-6	2	65	2-2	4-4	2	32

## HAULING FROM THE PACKING HOUSE

In hauling peaches to market by motor truck or in hauling from the packing house to the railroad, care to prevent bruising is necessary. If the peaches are packed in bushel or half-bushel baskets, the baskets should be arranged tightly in rows on the truck bed.

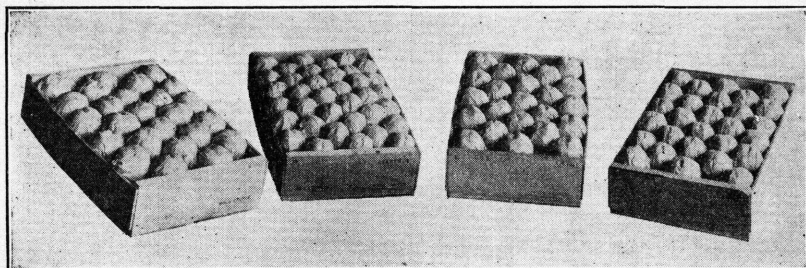


FIGURE 24.—Wrapped peaches packed in western boxes, showing method of arranging peaches of various sizes

Each basket in the second tier should rest as much as possible on the rims of two baskets in the first tier, to prevent bruising peaches in the bulged face of the pack. In hauling a considerable distance the load should be so arranged that it will not shift. Pieces of lumber may be used as bracing.

Trucks equipped with 2-tier racks are used by some shippers. (Fig. 25.) Boards supported by uprights and crosspieces may be used for the floor of the second tier. The boards must be removable so that the packages in the lower tier may be loaded and unloaded conveniently. A deck consisting of two parts, each the length of the truck bed and one-half its width, and both hinged to a piece of timber running lengthwise of the truck at the middle of the deck, is a convenient arrangement. The wings of this type of deck can be raised to permit loading and unloading the lower tier.

Six-basket carriers should not be loaded on their sides in trucks, as this may disarrange the peaches in the baskets. When crates are loaded more than one layer high without a deck, strips of lumber should be placed across the ends of the crates in the lower layer to prevent the second layer from resting heavily on the bulge of the lower crates.



## LOADING THE CAR

Essential points in loading a car are: The packages must be so arranged and braced that the load will not shift in transit and damage the fruit; they must be arranged to permit circulation of air through the load so that proper refrigeration can be obtained; the weight of the upper layers should not rest on the fruit in the lower layers. The car should be iced 12 hours or more before loading and the doors kept closed. The fruit should be protected from the hot sun while waiting to be loaded. Precooling the fruit before loading, if time and facilities permit, will promote lower temperatures in transit.

In a standard method of car loading of bushel baskets a row is started at one end and at the opposite side from the door where

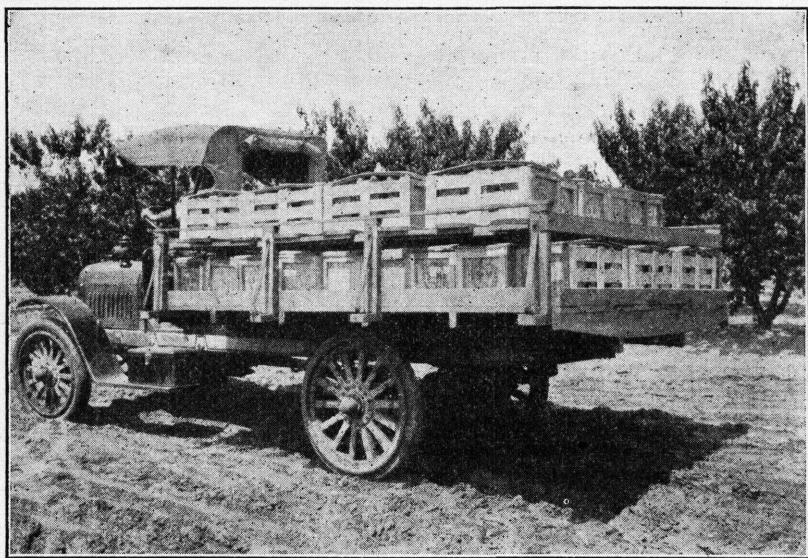


FIGURE 25.—This truck is equipped with a 2-tier rack, so that the containers in the upper tier do not rest on those below

the peaches are being brought in. The row is placed the length of the car with the baskets tightly together. (Fig. 26.) If there is vacant space between the last basket in the row and the end of the car, a bulkhead or bracing frame the width of the car and the height of the load should be constructed of boards or pieces of lumber to prevent shifting of the load. It should be so constructed as not to interfere with circulation of air through the load. A tight load that will not shift must be obtained. Shifting of the load in transit often results in loss to the shipper. It is desirable to have the baskets arranged so that the handles are all in the same relative position and so that a line through the handles would be diagonal to the side of the car.

The second layer of the first row is started at the same end of the car as the first layer, the baskets being placed so that they are not centered over the baskets in the first layer but so that each



basket rests on the rims of two baskets in the first layer. The baskets in the third layer of the first row are then placed in positions similar to those of the baskets in the first layer. The second row, three layers high, is then placed in position, starting at the same end of the car. The baskets in the lower layer of the second row should be offset with those in the lower layer of the first row.

After three rows (the length of the car and three layers high) have been placed, the remaining rows should be started from both ends of the car so that more room is allowed for bringing in the baskets. The load, the full width of the car and three layers high, is thus finished at the doorway.

Sometimes, if platform trucks are used to haul the baskets into the car, the load is built up to the full height, beginning at each end, so that the trucks will have plenty of room.

Occasionally cars have been loaded with part of the baskets inverted. This is not a good practice, as it may cause bruising of the fruit and may interfere with proper circulation of the air through the load.

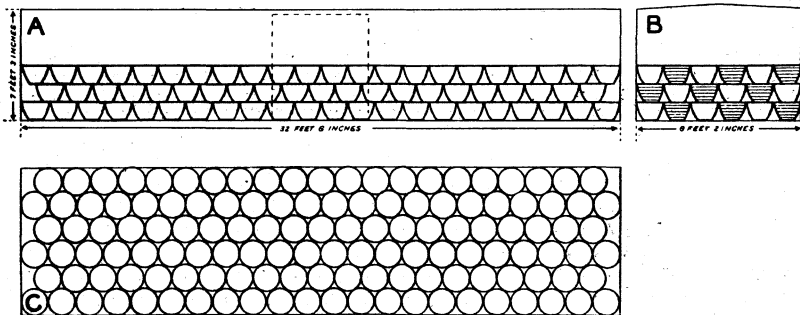


FIGURE 26.—Plan for carload of peaches in bushel baskets, 3 layers high and 129 baskets in each layer, or a total of 387 baskets in the load: A, Side view; B, end view; C, floor view

The number of bushel baskets loaded per car varies somewhat in different sections owing to variation in the arrangement of packages and in the size of cars. If the top layer is not completely filled out or if extra packages are placed on top of the load, special bracing must be used to prevent shifting of the load. In Idaho and Utah the load is usually four layers deep, making a total of 516 baskets. In Illinois and some other States, 396 bushel baskets is the usual load of peaches. This load consists of six rows with 22 baskets in a row, and three layers in the load.

The method of loading  $\frac{1}{2}$ -bushel baskets is similar to that of loading bushel baskets, and 784 is the usual number in a carload. The usual arrangement in the car is eight rows wide, offset; 24 and 25 stacks long; and four layers high.

Crates or carriers are loaded seven rows wide and four layers high. When 16 stacks are loaded there are 448 crates in the load. The crates are placed end to end, lengthwise of the car, with their tops up and not on their sides. Spaces are left between the rows from end to end of the car so that air will circulate and give proper refrigeration. Bulkheads or braces are placed at the end of the car if neces-

sary to obtain a tight load. Car strips are used to support the load and prevent the crates from bruising the peaches in the bulge of the crates in the under layers. These strips should be almost as long as the car is wide and thick enough to prevent the weight of the upper layers from resting on the bulge of the crates in the lower layers. They should never be less than 1 inch thick and 1 inch wide. The strips should be nailed across both ends of the crates and one end of each strip should be tight against the side of the car, alternating from one side of the car to the other. The crates in the second and higher layers are placed in exactly the same relative positions as are those in the first layer.

The common load of western boxes of 4½-inch depth for a refrigerator car is 1,260. Following are some descriptions of these loads: (1) Through load, 7 rows, evenly spaced, 20 stacks, 9 layers, fifth and top layers stripped. (2) Divided load, 7 rows, evenly spaced, 9 stacks, 10 layers; 10 stacks, 9 layers; fifth and top layers stripped. (3) Divided load, 7 rows, evenly spaced, 18 stacks, 10 layers; second, fifth, seventh, and top layers stripped. Ordinary building lath is used for stripping.

A standard type of bracing used by many shippers consists of seven uprights against each face of the load, two of these reaching to the car ceiling. Three stringers are placed across each set of uprights; and 12 wedges or cross braces are used to lock the bracing. Some shippers economize on the above type of bracing by using only two stringers against each face of the load, and eight wedges. All bracing material is of 2 by 4 inch dimension.

#### STORAGE OF PEACHES

At times when market conditions appeared to warrant, peaches have been held in cold storage for limited periods before being placed on the market. Whether this practice is justified depends on market conditions and outlook at the time, the quality of the fruit, and expense of storage. It has seldom been found advisable to hold peaches in storage for more than a few weeks.

#### GRADES AND INSPECTION

United States grading standards for peaches are in general use. These standards define in detail the requirements of the various grades and specify the tolerances of defective peaches which may be allowed in the various grades. The size of the peaches is stated separately from the grade. Thus, peaches of any size, as 2 to 2½ inches in diameter, may be United States Fancy, United States No. 1, or United States No. 2 grade. (For specific information on sizing practices see pages 24 to 29.) Copies of the grading standards are available for distribution by the Bureau of Agricultural Economics, United States Department of Agriculture.

The Federal-State inspection service at shipping point is available in most of the important commercial peach-producing areas. For a small fee the Federal-State inspection of a shipment can be had, including a certificate that shows the grade and size of fruit in the shipment and gives other pertinent information, such as kind of containers used and method of loading. Federal inspection is also



available in the large markets. There were 16,312 cars of peaches inspected at shipping points in 1931 compared with about 6,600 cars for the small crop of 1932. These figures are 44 per cent and 46 per cent respectively of the annual car-lot movements exclusive of shipments to canneries.

The general use of standard grades by growers and shippers has a number of advantages. It establishes confidence among buyers and sellers and helps to widen the market. Inspection at shipping point under standard grades tends to prevent unjustified rejection at destination in the case of a sale made f. o. b. usual terms. The grades serve as a common language between shipper and distant buyer and constitute a basis of quoting sales which is understood throughout the industry. Their use encourages better production methods among growers, for a premium in price is usually received for the higher grades as compared with lower grades or orchard-run fruit. The presence on the markets of poor quality and ungraded fruit adversely affects the sale of good stock.

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